

SEQUENCE LISTING

10 508965

<110> Transmolecular, Inc.
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GREENWOOD, John D

<120> Recombinant Expression Vectors for Functional Nav1.9 Sodium Channels

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<170> PatentIn version 3.1

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<211> 5905

<212> DNA

<213> Rattus norvegicus

<220>

<221> CDS

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Glu	Asp	Ser	Asp	Ile	Ser	Phe	Pro	Pro	Thr	Leu	Phe	Arg	Val	Val	
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Arg	Leu	Ala	Arg	Ile	Gly	Arg	Ile	Leu	Arg	Leu	Val	Arg	Ala	Ala	
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cgg 1460	gga	atc	agg	acc	ctc	ctc	ttt	gct	ttg	atg	atg	tct	ctc	ccc	4473
Arg	Gly	Ile	Arg	Thr	Leu	Leu	Phe	Ala	Leu	Met	Met	Ser	Leu	Pro	
1465					1465					1470					
tct 1475	ctc	ttc	aac	atc	ggc	ctg	ctg	ctc	ttc	ctg	gtg	atg	ttc	att	4518
Ser	Leu	Phe	Asn	Ile	Gly	Leu	Leu	Leu	Phe	Leu	Val	Met	Phe	Ile	
1480					1480					1485					
tac 1490	gcc	atc	ttt	ggg	atg	agc	tgg	ttt	tcc	aaa	gtg	aag	aag	ggc	4563
Tyr	Ala	Ile	Phe	Gly	Met	Ser	Trp	Phe	Ser	Lys	Val	Lys	Lys	Gly	
1495					1495					1500					
tcc 1505	ggg	atc	gac	gac	atc	ttc	aac	ttc	gag	acc	ttt	acg	ggc	agc	4608
Ser	Gly	Ile	Asp	Asp	Ile	Phe	Asn	Phe	Glu	Thr	Phe	Thr	Gly	Ser	
1510					1510					1515					
atg 1520	ctg	tgc	ctc	ttc	cag	ata	acc	act	tgc	gct	ggc	tgg	gat	acc	4653
Met	Leu	Cys	Leu	Phe	Gln	Ile	Thr	Thr	Ser	Ala	Gly	Trp	Asp	Thr	
1525					1525					1530					
ctc 1535	ctc	aac	ccc	atg	ctg	gag	gca	aaa	gaa	cac	tgc	aac	tcc	tcc	4698
Leu	Leu	Asn	Pro	Met	Leu	Glu	Ala	Lys	Glu	His	Cys	Asn	Ser	Ser	

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Ser	Gln	Asp	Ser	Cys	Gln	Gln	Pro	Gln	Ile	Ala	Val	Val	Tyr	Phe			
1550					1555					1560							
gtc	agt	tac	atc	atc	atc	tcc	ttc	ctc	atc	gtg	gtc	aac	atg	tac		4788	
Val	Ser	Tyr	Ile	Ile	Ile	Ser	Phe	Leu	Ile	Val	Val	Asn	Met	Tyr			
1565					1570					1575							
atc	gct	gtg	atc	ctc	gag	aac	ttc	aac	aca	gcc	acg	gag	gag	agc		4833	
Ile	Ala	Val	Ile	Leu	Glu	Asn	Phe	Asn	Thr	Ala	Thr	Glu	Glu	Ser			
1580					1585					1590							
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Glu	Asp	Pro	Leu	Gly	Glu	Asp	Asp	Phe	Glu	Ile	Phe	Tyr	Glu	Val			
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Trp	Glu	Lys	Phe	Asp	Pro	Glu	Ala	Ser	Gln	Phe	Ile	Gln	Tyr	Ser			
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Ala	Leu	Ser	Asp	Phe	Ala	Asp	Ala	Leu	Pro	Glu	Pro	Leu	Arg	Val			
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Ala	Lys	Pro	Asn	Lys	Phe	Gln	Phe	Leu	Val	Met	Asp	Leu	Pro	Met			
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Val	Met	Gly	Asp	Arg	Leu	His	Cys	Met	Asp	Val	Leu	Phe	Ala	Phe			
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Thr	Thr	Arg	Val	Leu	Gly	Asp	Ser	Ser	Gly	Leu	Asp	Thr	Met	Lys			
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Thr	Met	Met	Glu	Glu	Lys	Phe	Met	Glu	Ala	Asn	Pro	Phe	Lys	Lys			
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Leu	Tyr	Glu	Pro	Ile	Val	Thr	Thr	Thr	Lys	Arg	Lys	Glu	Glu	Glu			
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Gln	Gly	Ala	Ala	Val	Ile	Gln	Arg	Ala	Tyr	Arg	Lys	His	Met	Glu			
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Lys	Met	Val	Lys	Leu	Arg	Leu	Lys	Asp	Arg	Ser	Ser	Ser	Ser	His			
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Gln	Val	Phe	Cys	Asn	Gly	Asp	Leu	Ser	Ser	Leu	Asp	Val	Ala	Lys			
1745					1750					1755							
gtc	aag	gtt	cac	aat	gac	tga	accctcatct	ccaccctac	ctcactgcct							5379	
Val	Lys	Val	His	Asn	Asp												
1760					1765												


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Arg Pro Phe Thr Ser Asp Ser Leu Ala Ala Ile Glu Lys Arg Ile Ala
            20             25             30

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Ile Gln Lys Glu Arg Lys Lys Ser Lys Asp Lys Ala Ala Ala Glu Pro
35             40             45

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Gln Pro Arg Pro Gln Leu Asp Leu Lys Ala Ser Arg Lys Leu Pro Lys
50             55             60

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Leu Tyr Gly Asp Ile Pro Pro Glu Leu Val Ala Lys Pro Leu Glu Asp
65             70             75             80

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Leu Asp Pro Phe Tyr Lys Asp His Lys Thr Phe Met Val Leu Asn Lys
            85             90             95

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Lys Arg Thr Ile Tyr Arg Phe Ser Ala Lys Arg Ala Leu Phe Ile Leu
100             105             110

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Gly Pro Phe Asn Pro Leu Arg Ser Leu Met Ile Arg Ile Ser Val His
115             120             125

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Ser Val Phe Ser Met Phe Ile Ile Cys Thr Val Ile Ile Asn Cys Met
130             135             140

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Phe Met Ala Asn Ser Met Glu Arg Ser Phe Asp Asn Asp Ile Pro Glu
145 150 155 160

Tyr Val Phe Ile Gly Ile Tyr Ile Leu Glu Ala Val Ile Lys Ile Leu
165 170 175

Ala Arg Gly Phe Ile Val Asp Glu Phe Ser Phe Leu Arg Asp Pro Trp
180 185 190

Asn Trp Leu Asp Phe Ile Val Ile Gly Thr Ala Ile Ala Thr Cys Phe
195 200 205

Pro Gly Ser Gln Val Asn Leu Ser Ala Leu Arg Thr Phe Arg Val Phe
210 215 220

Arg Ala Leu Lys Ala Ile Ser Val Ile Ser Gly Leu Lys Val Ile Val
225 230 235 240

Gly Ala Leu Leu Arg Ser Val Lys Lys Leu Val Asp Val Met Val Leu
245 250 255

Thr Leu Phe Cys Leu Ser Ile Phe Ala Leu Val Gly Gln Gln Leu Phe
260 265 270

Met Gly Ile Leu Asn Gln Lys Cys Ile Lys His Asn Cys Gly Pro Asn
275 280 285

Pro Ala Ser Asn Lys Asp Cys Phe Glu Lys Glu Lys Asp Ser Glu Asp
290 295 300

Phe Ile Met Cys Gly Thr Trp Leu Gly Ser Arg Pro Cys Pro Asn Gly
305 310 315 320

Ser Thr Cys Asp Lys Thr Thr Leu Asn Pro Asp Asn Asn Tyr Thr Lys
325 330 335

Phe Asp Asn Phe Gly Trp Ser Phe Leu Ala Met Phe Arg Val Met Thr
340 345 350

-----Gln Asp Ser Trp Glu Arg Leu Tyr Arg Gln Ile Leu Arg Thr Ser Gly
355 360 365

Ile Tyr Phe Val Phe Phe Phe Val Val Val Ile Phe Leu Gly Ser Phe
370 375 380

Tyr Leu Leu Asn Leu Thr Leu Ala Val Val Thr Met Ala Tyr Glu Glu
385 390 395 400

Gln Asn Arg Asn Val Ala Ala Glu Thr Glu Ala Lys Glu Lys Met Phe
405 410 415

Gln Glu Ala Gln Gln Leu Leu Arg Glu Glu Lys Glu Ala Leu Val Ala
420 425 430

Met Gly Ile Asp Arg Ser Ser Leu Asn Ser Leu Gln Ala Ser Ser Phe
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Ser Pro Lys Lys Arg Lys Phe Phe Gly Ser Lys Thr Arg Lys Ser Phe
450 455 460

Phe Met Arg Gly Ser Lys Thr Ala Gln Ala Ser Ala Ser Asp Ser Glu
465 470 475 480

Asp Asp Ala Ser Lys Asn Pro Gln Leu Leu Glu Gln Thr Lys Arg Leu
485 490 495

Ser Gln Asn Leu Pro Val Asp Leu Phe Asp Glu His Val Asp Pro Leu
500 505 510

His Arg Gln Arg Ala Leu Ser Ala Val Ser Ile Leu Thr Ile Thr Met
515 520 525

Gln Glu Gln Glu Lys Phe Gln Glu Pro Cys Phe Pro Cys Gly Lys Asn
530 535 540

Leu Ala Ser Lys Tyr Leu Val Trp Asp Cys Ser Pro Gln Trp Leu Cys
545 550 555 560

Ile Lys Lys Val Leu Arg Thr Ile Met Thr Asp Pro Phe Thr Glu Leu
565 570 575

Ala Ile Thr Ile Cys Ile Ile Ile Asn Thr Val Phe Leu Ala Val Glu
580 585 590

His His Asn Met Asp Asp Asn Leu Lys Thr Ile Leu Lys Ile Gly Asn
595 600 605

Trp Val Phe Thr Gly Ile Phe Ile Ala Glu Met Cys Leu Lys Ile Ile
610 615 620

Ala Leu Asp Pro Tyr His Tyr Phe Arg His Gly Trp Asn Val Phe Asp
625 630 635 640

Ser Ile Val Ala Leu Leu Ser Leu Ala Asp Val Leu Tyr Asn Thr Leu
645 650 655

Ser Asp Asn Asn Arg Ser Phe Leu Ala Ser Leu Arg Val Leu Arg Val
660 665 670

Phe Lys Leu Ala Lys Ser Trp Pro Thr Leu Asn Thr Leu Ile Lys Ile
675 680 685

Ile Gly His Ser Val Gly Ala Leu Gly Asn Leu Thr Val Val Leu Thr
690 695 700

Ile Val Val Phe Ile Phe Ser Val Val Gly Met Arg Leu Phe Gly Thr
705 710 715 720

Lys Phe Asn Lys Thr Ala Tyr Ala Thr Gln Glu Arg Pro Arg Arg Arg
725 730 735

Trp His Met Asp Asn Phe Tyr His Ser Phe Leu Val Val Phe Arg Ile
740 745 750

Leu Cys Gly Glu Trp Ile Glu Asn Met Trp Gly Cys Met Gln Asp Met
755 760 765

Asp Gly Ser Pro Leu Cys Ile Ile Val Phe Val Leu Ile Met Val Ile
770 775 780

Gly Lys Leu Val Val Leu Asn Leu Phe Ile Ala Leu Leu Leu Asn Ser
785 790 795 800

Phe Ser Asn Glu Glu Lys Asp Gly Ser Leu Glu Gly Glu Thr Arg Lys
805 810 815

Thr Lys Val Gln Leu Ala Leu Asp Arg Phe Arg Arg Ala Phe Ser Phe
820 825 830

Met Leu His Ala Leu Gln Ser Phe Cys Cys Lys Lys Cys Arg Arg Lys
835 840 845

Asn Ser Pro Lys Pro Lys Glu Thr Thr Glu Ser Phe Ala Gly Glu Asn
850 855 860

Lys Asp Ser Ile Leu Pro Asp Ala Arg Pro Trp Lys Glu Tyr Asp Thr

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Asp Met Ala Leu Tyr	Thr Gly Gln Ala Gly	Ala Pro Leu Ala Pro	Leu
885	890	895	
Ala Glu Val Glu Asp	Asp Val Glu Tyr Cys Gly	Glu Gly Gly Ala Leu	
900	905	910	
Pro Thr Ser Gln His	Ser Ala Gly Val Gln Ala Gly	Asp Leu Pro Pro	
915	920	925	
Glu Thr Lys Gln Leu Thr	Ser Pro Asp Asp Gln Gly	Val Glu Met Glu	
930	935	940	
Val Phe Ser Glu Glu Asp	Leu His Leu Ser Ile Gln Ser	Pro Arg Lys	
945	950	955	960
Lys Ser Asp Ala Val Ser	Met Leu Ser Glu Cys Ser Thr	Ile Asp Leu	
965	970	975	
Asn Asp Ile Phe Arg Asn	Leu Gln Lys Thr Val Ser Pro	Lys Lys Gln	
980	985	990	
Pro Asp Arg Cys Phe Pro	Lys Gly Leu Ser Cys His Phe	Leu Cys His	
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Lys Thr Asp Lys Arg Lys	Ser Pro Trp Val Leu Trp	Trp Asn Ile	
1010	1015	1020	
Arg Lys Thr Cys Tyr Gln	Ile Val Lys His Ser Trp	Phe Glu Ser	
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Phe Ile Ile Phe Val Ile	Leu Leu Ser Ser Gly Ala	Leu Ile Phe	
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Glu Asp Val Asn Leu Pro	Ser Arg Pro Gln Val Glu	Lys Leu Leu	
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Arg Cys Thr Asp Asn Ile	Phe Thr Phe Ile Phe Leu	Leu Glu Met	
1070	1075	1080	
Ile Leu Lys Trp Val Ala	Phe Gly Phe Arg Arg Tyr	Phe Thr Ser	
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Ala Trp Cys Trp Leu Asp	Phe Leu Ile Val Val Val	Ser Val Leu	
1100	1105	1110	

Ser Leu Met Asn Leu Pro Ser Leu Lys Ser Phe Arg Thr Leu Arg
1115 1120 1125

Ala Leu Arg Pro Leu Arg Ala Leu Ser Gln Phe Glu Gly Met Lys
1130 1135 1140

Val Val Val Tyr Ala Leu Ile Ser Ala Ile Pro Ala Ile Leu Asn
1145 1150 1155

Val Leu Leu Val Cys Leu Ile Phe Trp Leu Val Phe Cys Ile Leu
1160 1165 1170

Gly Val Asn Leu Phe Ser Gly Lys Phe Gly Arg Cys Ile Asn Gly
1175 1180 1185

Thr Asp Ile Asn Met Tyr Leu Asp Phe Thr Glu Val Pro Asn Arg
1190 1195 1200

Ser Gln Cys Asn Ile Ser Asn Tyr Ser Trp Lys Val Pro Gln Val
1205 1210 1215

Asn Phe Asp Asn Val Gly Asn Ala Tyr Leu Ala Leu Leu Gln Val
1220 1225 1230

Ala Thr Tyr Lys Gly Trp Leu Glu Ile Met Asn Ala Ala Val Asp
1235 1240 1245

Ser Arg Glu Lys Asp Glu Gln Pro Asp Phe Glu Ala Asn Leu Tyr
1250 1255 1260

Ala Tyr Leu Tyr Phe Val Val Phe Ile Ile Phe Gly Ser Phe Phe
1265 1270 1275

Thr Leu Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn Gln
1280 1285 1290

Gln Gln Lys Lys Leu Gly Gly Gln Asp Ile Phe Met Thr Glu Glu
1295 1300 1305

Gln Lys Lys Tyr Tyr Asn Ala Met Lys Lys Leu Gly Thr Lys Lys
1310 1315 1320

Pro Gln Lys Pro Ile Pro Arg Pro Leu Asn Lys Cys Gln Ala Phe
1325 1330 1335

Val	Phe	Asp	Leu	Val	Thr	Ser	Gln	Val	Phe	Asp	Val	Ile	Ile	Leu
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Gly	Leu	Ile	Val	Leu	Asn	Met	Ile	Ile	Met	Met	Ala	Glu	Ser	Ala
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Asp	Gln	Pro	Lys	Asp	Val	Lys	Lys	Thr	Phe	Asp	Ile	Leu	Asn	Ile
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Ala	Phe	Val	Val	Ile	Phe	Thr	Ile	Glu	Cys	Leu	Ile	Lys	Val	Phe
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Ala	Leu	Arg	Gln	His	Tyr	Phe	Thr	Asn	Gly	Trp	Asn	Leu	Phe	Asp
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Cys	Val	Val	Val	Val	Leu	Ser	Ile	Ile	Ser	Thr	Leu	Val	Ser	Arg
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Leu	Glu	Asp	Ser	Asp	Ile	Ser	Phe	Pro	Pro	Thr	Leu	Phe	Arg	Val
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Val	Arg	Leu	Ala	Arg	Ile	Gly	Arg	Ile	Leu	Arg	Leu	Val	Arg	Ala
1445						1450					1455			
Ala	Arg	Gly	Ile	Arg	Thr	Leu	Leu	Phe	Ala	Leu	Met	Met	Ser	Leu
1460						1465					1470			
Pro	Ser	Leu	Phe	Asn	Ile	Gly	Leu	Leu	Leu	Phe	Leu	Val	Met	Phe
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Ile	Tyr	Ala	Ile	Phe	Gly	Met	Ser	Trp	Phe	Ser	Lys	Val	Lys	Lys
1490						1495					1500			
Gly	Ser	Gly	Ile	Asp	Asp	Ile	Phe	Asn	Phe	Glu	Thr	Phe	Thr	Gly
1505						1510					1515			
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1520						1525					1530			
Thr	Leu	Leu	Asn	Pro	Met	Leu	Glu	Ala	Lys	Glu	His	Cys	Asn	Ser
1535						1540					1545			
Ser	Ser	Gln	Asp	Ser	Cys	Gln	Gln	Pro	Gln	Ile	Ala	Val	Val	Tyr
1550						1555					1560			

Phe Val	Ser Tyr Ile Ile Ile	Ser Phe Leu Ile Val	Val Asn Met
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Tyr Ile	Ala Val Ile Leu Glu	Asn Phe Asn Thr Ala	Thr Glu Glu
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Ser Glu	Asp Pro Leu Gly Glu	Asp Asp Phe Glu Ile	Phe Tyr Glu
1595		1600	1605
Val Trp	Glu Lys Phe Asp Pro	Glu Ala Ser Gln Phe	Ile Gln Tyr
1610		1615	1620
Ser Ala	Leu Ser Asp Phe Ala	Asp Ala Leu Pro Glu	Pro Leu Arg
1625		1630	1635
Val Ala	Lys Pro Asn Lys Phe	Gln Phe Leu Val Met	Asp Leu Pro
1640		1645	1650
Met Val	Met Gly Asp Arg Leu	His Cys Met Asp Val	Leu Phe Ala
1655		1660	1665
Phe Thr	Thr Arg Val Leu Gly	Asp Ser Ser Gly Leu	Asp Thr Met
1670		1675	1680
Lys Thr	Met Met Glu Glu Lys	Phe Met Glu Ala Asn	Pro Phe Lys
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Lys Leu	Tyr Glu Pro Ile Val	Thr Thr Thr Lys Arg	Lys Glu Glu
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Glu Gln	Gly Ala Ala Val Ile	Gln Arg Ala Tyr Arg	Lys His Met
1715		1720	1725
Glu Lys	Met Val Lys Leu Arg	Leu Lys Asp Arg Ser	Ser Ser Ser
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aaa gac cag aca gga gaa gta ccc cag cct cgg cct cag ctt gac cta      198
Lys Asp Gln Thr Gly Glu Val Pro Gln Pro Arg Pro Gln Leu Asp Leu
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aag gcc tcc agg aag ttg ccc aag ctc tat ggc gac att cct cgt gag      246
Lys Ala Ser Arg Lys Leu Pro Lys Leu Tyr Gly Asp Ile Pro Arg Glu
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ctc ata gga aag cct ctg gaa gac ttg gac cca ttc tac cga aat cat      294
Leu Ile Gly Lys Pro Leu Glu Asp Leu Asp Pro Phe Tyr Arg Asn His
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aag aca ttt atg gtg tta aac aga aag agg aca atc tac cgc ttc agt      342
Lys Thr Phe Met Val Leu Asn Arg Lys Arg Thr Ile Tyr Arg Phe Ser
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gcc aag cat gcc ttg ttc att ttt ggg cct ttc aat tca atc aga agt      390
Ala Lys His Ala Leu Phe Ile Phe Gly Pro Phe Asn Ser Ile Arg Ser
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tta gcc att aga gtc tca gtc cat tca ttg ttc agc atg ttc att atc      438
Leu Ala Ile Arg Val Ser Val His Ser Leu Phe Ser Met Phe Ile Ile
 125                               130                               135

ggc acc gtt atc atc aac tgc gtg ttc atg gct aca ggg cct gct aaa      486
Gly Thr Val Ile Ile Asn Cys Val Phe Met Ala Thr Gly Pro Ala Lys
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Asn Ser Asn Ser Asn Asn Thr Asp Ile Ala Glu Cys Val Phe Thr Gly
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att tat att ttt gaa gct ttg att aaa ata ttg gca aga ggt ttc att      582
Ile Tyr Ile Phe Glu Ala Leu Ile Lys Ile Leu Ala Arg Gly Phe Ile
 170                               175                               180
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ctg gat gag ttt tct ttc ctt cga gat cca tgg aac tgg ctg gac tcc      630
Leu Asp Glu Phe Ser Phe Leu Arg Asp Pro Trp Asn Trp Leu Asp Ser
 185                               190                               195                               200

att gtc att gga ata gcg att gtg tca tat att cca gga atc acc atc      678
Ile Val Ile Gly Ile Ala Ile Val Ser Tyr Ile Pro Gly Ile Thr Ile

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Lys	Leu	Leu	Pro	Leu	Arg	Thr	Phe	Arg	Val	Phe	Arg	Ala	Leu	Lys	Ala																																	
			220											230																																		
att	tca	gta	gtt	tca	cgt	ctg	aag	gtc	atc	gtg	ggg	gcc	ttg	cta	cgc		774																															
Ile	Ser	Val	Val	Ser	Arg	Leu	Lys	Val	Ile	Val	Gly	Ala	Leu	Leu	Arg																																	
			235										245																																			
tct	gtg	aag	aag	ctg	gtc	aac	gtg	att	atc	ctc	acc	ttc	ttt	tgc	ctc		822																															
Ser	Val	Lys	Lys	Leu	Val	Asn	Val	Ile	Ile	Leu	Thr	Phe	Phe	Cys	Leu																																	
			250										260																																			
agc	atc	ttt	gcc	ctg	gta	ggg	cag	cag	ctc	ttc	atg	gga	agt	ctg	aac		870																															
Ser	Ile	Phe	Ala	Leu	Val	Gly	Gln	Gln	Leu	Phe	Met	Gly	Ser	Leu	Asn																																	
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Glu Ser Gly Lys Asp Gln Pro Pro Gly Ser Asp Ser Asp Glu Asp Cys	
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Gln Lys Lys Pro Gln Leu Leu Glu Gln Thr Lys Arg Leu Ser Gln Asn	
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Pro Tyr His Tyr Phe Arg Arg Gly Trp Asn Ile Phe Asp Ser Ile Val	
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Phe Ile Phe Ser Val Val Gly Met Gln Leu Phe Gly Arg Ser Phe Asn	
715 720 725	
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Cys Leu Arg His Trp His Met Gly Asp Phe Trp His Ser Phe Leu Val	
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Val Phe Arg Ile Leu Cys Gly Glu Trp Ile Glu Asn Met Trp Glu Cys	
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Gly Glu Ala Arg Lys Thr Lys Val Gln Leu Ala Leu Asp Arg Phe Arg	
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Cys Ala Ala Gln Ser Lys Asp Ile Ile Pro Leu Val Met Glu Met Lys	
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Lys Thr Leu Gly Val Arg His Asp Trp Thr Trp Leu Ala Pro Leu Ala	
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Ile Thr Gln Pro Glu Pro Glu Gln Gln Ala Tyr Glu Leu His Gln Glu	
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Asn Lys Lys Pro Thr Ser Gln Arg Val Gln Ser Val Glu Ile Asp Met	
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Phe Ser Glu Asp Glu Pro His Leu Thr Ile Gln Asp Pro Arg Lys Lys	
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1080	1085 1090 1095
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Val Leu Lys Trp Val Ala Phe Gly Phe Gly Lys Tyr Phe Thr Ser	
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Ala Trp Cys Cys Leu Asp Phe Ile Ile Val Ile Val Ser Val Thr	
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Gln Pro Arg Pro Gln Leu Asp Leu Lys Ala Ser Arg Lys Leu Pro Lys
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Leu Tyr Gly Asp Ile Pro Arg Glu Leu Ile Gly Lys Pro Leu Glu Asp
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Gly Pro Phe Asn Ser Ile Arg Ser Leu Ala Ile Arg Val Ser Val His
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Asp Pro Trp Asn Trp Leu Asp Ser Ile Val Ile Gly Ile Ala Ile Val
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Ser Tyr Ile Pro Gly Ile Thr Ile Lys Leu Leu Pro Leu Arg Thr Phe
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Arg Val Phe Arg Ala Leu Lys Ala Ile Ser Val Val Ser Arg Leu Lys
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Val Ile Val Gly Ala Leu Leu Arg Ser Val Lys Lys Leu Val Asn Val
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Gln Leu Phe Met Gly Ser Leu Asn Leu Lys Cys Ile Ser Arg Asp Cys
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Lys Asn Ile Ser Asn Pro Glu Ala Tyr Asp His Cys Phe Glu Lys Lys
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Glu Asn Ser Pro Glu Phe Lys Met Cys Gly Ile Trp Met Gly Asn Ser
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Ala Cys Ser Ile Gln Tyr Glu Cys Lys His Thr Lys Ile Asn Pro Asp
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Tyr Asn Tyr Thr Asn Phe Asp Asn Phe Gly Trp Ser Phe Leu Ala Met
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Phe Arg Leu Met Thr Gln Asp Ser Trp Glu Lys Leu Tyr Gln Gln Thr
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Leu Arg Thr Thr Gly Leu Tyr Ser Val Phe Phe Phe Ile Val Val Ile
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Phe Leu Gly Ser Phe Tyr Leu Ile Asn Leu Thr Leu Ala Val Val Thr
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Gln Thr Lys Arg Leu Ser Gln Asn Leu Ser Leu Asp His Phe Asp Glu
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His Gly Asp Pro Leu Gln Arg Gln Arg Ala Leu Ser Ala Val Ser Ile
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Leu Thr Ile Thr Met Lys Glu Gln Glu Lys Ser Gln Glu Pro Cys Leu
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Pro Cys Gly Glu Asn Leu Ala Ser Lys Tyr Leu Val Trp Asn Cys Cys
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Pro Phe Thr Glu Leu Ala Ile Thr Ile Cys Ile Ile Ile Asn Thr Val
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Phe Leu Ala Met Glu His His Lys Met Glu Ala Ser Phe Glu Lys Met
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Leu Asn Ile Gly Asn Leu Val Phe Thr Ser Ile Phe Ile Ala Glu Met
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Cys Leu Lys Ile Ile Ala Leu Asp Pro Tyr His Tyr Phe Arg Arg Gly
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Trp Asn Ile Phe Asp Ser Ile Val Ala Leu Leu Ser Phe Ala Asp Val
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Met Asn Cys Val Leu Gln Lys Arg Ser Trp Pro Phe Leu Arg Ser Phe
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Arg Val Leu Arg Val Phe Lys Leu Ala Lys Ser Trp Pro Thr Leu Asn
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Thr Leu Ile Lys Ile Ile Gly Asn Ser Val Gly Ala Leu Gly Ser Leu
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Thr Val Val Leu Val Ile Val Ile Phe Ile Phe Ser Val Val Gly Met
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Asn Pro Thr Gly Pro Thr Val Ser Cys Leu Arg His Trp His Met Gly
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Gln Ala Tyr Glu Leu His Gln Glu Asn Lys Lys Pro Thr Ser Gln Arg

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Val Gln Ser Val Glu Ile Asp Met Phe Ser Glu Asp Glu Pro His Leu	965	970	975
Thr Ile Gln Asp Pro Arg Lys Lys Ser Asp Val Thr Ser Ile Leu Ser	980	985	990
Glu Cys Ser Thr Ile Asp Leu Gln Asp Gly Phe Gly Trp Leu Pro Glu	995	1000	1005
Met Val Pro Lys Lys Gln Pro Glu Arg Cys Leu Pro Lys Gly Phe	1010	1015	1020
Gly Cys Cys Phe Pro Cys Cys Ser Val Asp Lys Arg Lys Pro Pro	1025	1030	1035
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Lys His Ser Trp Phe Glu Ser Phe Ile Ile Phe Val Ile Leu Leu	1055	1060	1065
Ser Ser Gly Ala Leu Ile Phe Glu Asp Val His Leu Glu Asn Gln	1070	1075	1080
Pro Lys Ile Gln Glu Leu Leu Asn Cys Thr Asp Ile Ile Phe Thr	1085	1090	1095
His Ile Phe Ile Leu Glu Met Val Leu Lys Trp Val Ala Phe Gly	1100	1105	1110
Phe Gly Lys Tyr Phe Thr Ser Ala Trp Cys Cys Leu Asp Phe Ile	1115	1120	1125
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Lys Ser Phe Arg Thr Leu Arg Ala Leu Arg Pro Leu Arg Ala Leu	1145	1150	1155
Ser Gln Phe Glu Gly Met Lys Val Val Val Asn Ala Leu Ile Gly	1160	1165	1170
Ala Ile Pro Ala Ile Leu Asn Val Leu Leu Val Cys Leu Ile Phe	1175	1180	1185

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Ile Val	Val Asn Met Tyr	Ile	Ala Val Ile Leu	Glu	Asn Phe Asn	
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Thr Ala	Thr Glu Glu Ser	Glu	Asp Pro Leu Gly	Glu	Asp Asp Phe	
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Gln Phe Ile Lys Tyr Ser Ala Leu Ser Asp Phe Ala Asp Ala Leu
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Pro Glu Pro Leu Arg Val Ala Lys Pro Asn Lys Tyr Gln Phe Leu
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Val Met Asp Leu Pro Met Val Ser Glu Asp Arg Leu His Cys Met
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Gly Leu Asp Ser Met Lys Ala Met Met Glu Glu Lys Phe Met Glu
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Gln Asn Asp Leu Glu Asn Gly Pro His Ser Pro Leu Gln Thr Leu
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Phe	Asp	Glu	His	Val	Asp	Pro	Leu	His	Arg	Gln	Arg	Ala	Leu	Ser	Ala	
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Trp	Lys	Glu	Tyr	Asp	Ser	Glu	Met	Thr	Leu	Tyr	Thr	Gly	Gln	Ala	Gly	
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Ala	Pro	Leu	Ala	Pro	Leu	Ala	Lys	Glu	Glu	Asp	Asp	Met	Glu	Cys	Cys	
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Gly	Glu	Cys	Asp	Ala	Ser	Pro	Thr	Ser	Gln	Pro	Ser	Glu	Glu	Ala	Gln	
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Ala	Cys	Asp	Leu	Pro	Leu	Lys	Thr	Lys	Arg	Leu	Pro	Ser	Pro	Asp	Asp	
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His	Gly	Val	Glu	Met	Glu	Val	Phe	Ser	Glu	Glu	Asp	Pro	Asn	Leu	Thr	
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Ile	Gln	Ser	Ala	Arg	Lys	Lys	Ser	Asp	Ala	Ala	Ser	Met	Leu	Ser	Glu	
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Cys Ser Thr Ile Asp Leu Asn Asp Ile Phe Arg Asn Leu Gln Lys Thr	
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Cys Ile Phe Leu Cys Cys Lys Thr Ile Lys Lys Lys Ser Pro Trp	
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Phe Glu Ala Asn Leu Tyr Ala Tyr Leu Tyr Phe Val Val Phe Ile	
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Ile Asp Asn Phe Asn Gln Gln Gln Lys Lys Leu Gly Gly Gln Asp	
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Lys Leu Gly Thr Lys Lys Pro Gln Lys Pro Ile Pro Arg Pro Leu	
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Arg	Leu	Val	Arg	Ala	Ala	Arg	Gly	Ile	Arg	Thr	Leu	Leu	Phe	Ala	
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Leu	Met	Met	Ser	Leu	Pro	Ser	Leu	Phe	Asn	Ile	Gly	Leu	Leu	Leu	
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Ile	Ala	Ile	Val	Tyr	Phe	Val	Ser	Tyr	Ile	Ile	Ile	Ser	Phe	Leu	
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Asp Val Leu Phe Ala Phe Thr	Thr Arg Val Leu Gly	Asn Ser Ser	
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Gly Leu Asp Thr Met Lys Ala	Met Met Glu Glu Lys	Phe Met Glu	
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Ala Asn Pro Phe Lys Lys Leu	Tyr Glu Pro Ile Val	Thr Thr Thr	
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Lys Arg Lys Glu Glu Glu Glu	Cys Ala Ala Val Ile	Gln Arg Ala	
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Tyr Arg Arg His Met Glu Lys	Met Ile Lys Leu Lys	Leu Lys Gly	
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Arg Ser Ser Ser Ser Leu Gln	Val Phe Cys Asn Gly	Asp Leu Ser	
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Ser Leu Asp Val Pro Lys Ile	Lys Val His Cys Asp		
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 35 40 45

Gln Pro Arg Pro Gln Leu Asp Leu Lys Ala Ser Arg Lys Leu Pro Lys
 50 55 60

Leu Tyr Gly Asp Val Pro Pro Asp Leu Ile Ala Lys Pro Leu Glu Asp
 65 70 75 80

Leu Asp Pro Phe Tyr Lys Asp His Lys Thr Phe Met Val Leu Asn Lys
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Lys Arg Thr Ile Tyr Arg Phe Ser Ala Lys Arg Ala Leu Phe Ile Leu
 100 105 110

Gly Pro Phe Asn Pro Ile Arg Ser Phe Met Ile Arg Ile Ser Val His
 115 120 125

Ser Val Phe Ser Met Phe Ile Ile Cys Thr Val Ile Ile Asn Cys Met
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Phe Met Ala Asn Asn Ser Ser Val Asp Ser Arg Pro Ser Ser Asn Ile
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Pro Glu Tyr Val Phe Ile Gly Ile Tyr Val Leu Glu Ala Val Ile Lys
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Ile Leu Ala Arg Gly Phe Ile Val Asp Glu Phe Ser Tyr Leu Arg Asp
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Pro Trp Asn Trp Leu Asp Phe Ile Val Ile Gly Thr Ala Ile Ala Pro
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Cys Phe Leu Gly Asn Lys Val Asn Asn Leu Ser Thr Leu Arg Thr Phe
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Arg Val Leu Arg Ala Leu Lys Ala Ile Ser Val Ile Ser Gly Leu Lys
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Val Ile Val Gly Ala Leu Leu Arg Ser Val Lys Lys Leu Val Asp Val

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Asp	Ser	Glu	Asp	Asp	Ala	Ser	Lys	Asn	Pro	Gln	Leu	Leu	Glu	Gln	Thr
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Lys Pro Gln Lys Pro Ile 1325	Pro Arg Pro Leu Asn 1330	Lys Cys Gln Ala 1335
Phe Val Phe Asp Leu Val 1340	Thr Ser Gln Val Phe 1345	Asp Val Ile Ile 1350
Leu Gly Leu Ile Val Thr 1355	Asn Met Ile Ile Met 1360	Met Ala Glu Ser 1365
Glu Gly Gln Pro Asn Glu 1370	Val Lys Lys Ile Phe 1375	Asp Ile Leu Asn 1380
Ile Val Phe Val Val Ile 1385	Phe Thr Val Glu Cys 1390	Leu Ile Lys Val 1395
Phe Ala Leu Arg Gln His 1400	Tyr Phe Thr Asn Gly 1405	Trp Asn Leu Phe 1410
Asp Cys Val Val Val Val 1415	Leu Ser Ile Ile Ser 1420	Thr Leu Val Ser 1425
Gly Leu Glu Asn Ser Asn 1430	Val Phe Pro Pro Thr 1435	Leu Phe Arg Ile 1440

Val Arg Leu Ala Arg Ile Gly Arg Ile Leu Arg Leu Val Arg Ala
1445 1450 1455

Ala Arg Gly Ile Arg Thr Leu Leu Phe Ala Leu Met Met Ser Leu
1460 1465 1470

Pro Ser Leu Phe Asn Ile Gly Leu Leu Leu Phe Leu Val Met Phe
1475 1480 1485

Ile Tyr Ala Ile Phe Gly Met Asn Trp Phe Ser Lys Val Lys Arg
1490 1495 1500

Gly Ser Gly Ile Asp Asp Ile Phe Asn Phe Asp Thr Phe Ser Gly
1505 1510 1515

Ser Met Leu Cys Leu Phe Gln Ile Thr Thr Ser Ala Gly Trp Asp
1520 1525 1530

Ala Leu Leu Asn Pro Met Leu Glu Ser Lys Ala Ser Cys Asn Ser
1535 1540 1545

Ser Ser Gln Glu Ser Cys Gln Gln Pro Gln Ile Ala Ile Val Tyr
1550 1555 1560

Phe Val Ser Tyr Ile Ile Ile Ser Phe Leu Ile Val Val Asn Met
1565 1570 1575

Tyr Ile Ala Val Ile Leu Glu Asn Phe Asn Thr Ala Thr Glu Glu
1580 1585 1590

Ser Glu Asp Pro Leu Gly Glu Asp Asp Phe Glu Ile Phe Tyr Glu
1595 1600 1605

Ile Trp Glu Lys Phe Asp Pro Glu Ala Thr Gln Phe Ile Gln Tyr
1610 1615 1620

Ser Ser Leu Ser Asp Phe Ala Asp Ala Leu Pro Glu Pro Leu Arg
1625 1630 1635

~~Val Ala Lys Pro Asn Arg Phe Gln Phe Leu Met Met Asp Leu Pro~~
1640 1645 1650

Met Val Met Gly Asp Arg Leu His Cys Met Asp Val Leu Phe Ala
1655 1660 1665

Phe Thr Thr Arg Val Leu Gly Asn Ser Ser Gly Leu Asp Thr Met
 1670 1675 1680

Lys Ala Met Met Glu Glu Lys Phe Met Glu Ala Asn Pro Phe Lys
 1685 1690 1695

Lys Leu Tyr Glu Pro Ile Val Thr Thr Thr Lys Arg Lys Glu Glu
 1700 1705 1710

Glu Glu Cys Ala Ala Val Ile Gln Arg Ala Tyr Arg Arg His Met
 1715 1720 1725

Glu Lys Met Ile Lys Leu Lys Leu Lys Gly Arg Ser Ser Ser Ser
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Lys Ile Lys Val His Cys Asp
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<220>
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23

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<220>
<221> misc_feature
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<400> 13

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<210> 14

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<212> DNA

<213> Artificial Sequence

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<223> engineers NotI and ClaI sites at 3' end of rNaN ORF

<220>

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<220>

<223> Forward primer amplifying GFP from pEGFP-C2

<220>

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46

<210> 16

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<212> DNA

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<220>

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34

<210> 17
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<220>
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<220>
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 T>C at nt 4056

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 Met Glu Glu Arg Tyr Tyr Pro Val Ile Phe Pro Asp Glu Arg Asn Phe
 1 5 10 15

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 Arg Pro Phe Thr Ser Asp Ser Leu Ala Ala Ile Glu Lys Arg Ile Ala
 20 25 30

atc caa aag gag agg aag aag tcc aaa gac aag gcg gca gct gag ccc 144
 Ile Gln Lys Glu Arg Lys Lys Ser Lys Asp Lys Ala Ala Ala Glu Pro
 35 40 45

cag cct cgg cct cag ctt gac cta aag gcc tcc agg aag tta cct aag 192

Gln	Pro	Arg	Pro	Gln	Leu	Asp	Leu	Lys	Ala	Ser	Arg	Lys	Leu	Pro	Lys	
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Leu	Tyr	Gly	Asp	Ile	Pro	Pro	Glu	Leu	Val	Ala	Lys	Pro	Leu	Glu	Asp	
65					70				75					80		
ctg	gac	cca	ttc	tac	aaa	gac	cat	aag	aca	ttc	atg	gtg	ttg	aac	aag	288
Leu	Asp	Pro	Phe	Tyr	Lys	Asp	His	Lys	Thr	Phe	Met	Val	Leu	Asn	Lys	
				85					90					95		
aag	aga	aca	att	tat	cgc	ttc	agc	gcc	aag	cgg	gcc	ttg	ttc	att	ctg	336
Lys	Arg	Thr	Ile	Tyr	Arg	Phe	Ser	Ala	Lys	Arg	Ala	Leu	Phe	Ile	Leu	
			100					105					110			
ggg	cct	ttt	aat	ccc	ctc	aga	agc	tta	atg	att	cgt	atc	tct	gtc	cat	384
Gly	Pro	Phe	Asn	Pro	Leu	Arg	Ser	Leu	Met	Ile	Arg	Ile	Ser	Val	His	
		115					120					125				
tca	gtc	ttt	agc	atg	ttc	atc	atc	tgc	acg	gtg	atc	atc	aac	tgt	atg	432
Ser	Val	Phe	Ser	Met	Phe	Ile	Ile	Cys	Thr	Val	Ile	Ile	Asn	Cys	Met	
	130					135					140					
ttc	atg	gcg	aat	tct	atg	gag	aga	agt	ttc	gac	aac	gac	att	ccc	gaa	480
Phe	Met	Ala	Asn	Ser	Met	Glu	Arg	Ser	Phe	Asp	Asn	Asp	Ile	Pro	Glu	
145					150					155					160	
tac	gtc	ttc	att	ggg	att	tat	att	tta	gaa	gct	gtg	att	aaa	ata	ttg	528
Tyr	Val	Phe	Ile	Gly	Ile	Tyr	Ile	Leu	Glu	Ala	Val	Ile	Lys	Ile	Leu	
				165					170					175		
gca	aga	ggc	ttc	att	gtg	gat	gag	ttt	tcc	ttc	ctc	cga	gat	ccg	tgg	576
Ala	Arg	Gly	Phe	Ile	Val	Asp	Glu	Phe	Ser	Phe	Leu	Arg	Asp	Pro	Trp	
			180					185					190			
aac	tgg	ctg	gac	ttc	att	gtc	att	gga	aca	gcg	atc	gca	act	tgt	ttt	624
Asn	Trp	Leu	Asp	Phe	Ile	Val	Ile	Gly	Thr	Ala	Ile	Ala	Thr	Cys	Phe	
		195					200					205				
ccg	ggc	agc	caa	gtc	aat	ctt	tca	gct	ctt	cgt	acc	ttc	cga	gtg	ttc	672
Pro	Gly	Ser	Gln	Val	Asn	Leu	Ser	Ala	Leu	Arg	Thr	Phe	Arg	Val	Phe	
	210					215					220					
aga	gct	ctg	aag	gcg	att	tca	gtt	atc	tca	ggg	ctg	aag	gtc	atc	gta	720
Arg	Ala	Leu	Lys	Ala	Ile	Ser	Val	Ile	Ser	Gly	Leu	Lys	Val	Ile	Val	
225					230					235					240	
ggg	gcc	ctg	ctg	cgc	tcg	gtg	aag	aag	ctg	gta	gac	gtg	atg	gtc	ctc	768
Gly	Ala	Leu	Leu	Arg	Ser	Val	Lys	Lys	Leu	Val	Asp	Val	Met	Val	Leu	
				245					250					255		
act	ctc	ttc	tgc	ctc	agc	atc	ttt	gcc	ctg	gtc	ggg	cag	cag	ctg	ttc	816
Thr	Leu	Phe	Cys	Leu	Ser	Ile	Phe	Ala	Leu	Val	Gly	Gln	Gln	Leu	Phe	
			260					265					270			
atg	gga	att	ctg	aac	cag	aag	tgt	att	aag	cac	aac	tgt	ggc	ccc	aac	864
Met	Gly	Ile	Leu	Asn	Gln	Lys	Cys	Ile	Lys	His	Asn	Cys	Gly	Pro	Asn	
		275					280					285				
cct	gca	tcc	aac	aag	gat	tgc	ttt	gaa	aag	gaa	aaa	gat	agc	gaa	gac	912
Pro	Ala	Ser	Asn	Lys	Asp	Cys	Phe	Glu	Lys	Glu	Lys	Asp	Ser	Glu	Asp	

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ttt gac aac ttt ggc tgg tcc ttt ctc gcc atg ttc cgg gtt atg act Phe Asp Asn Phe Gly Trp Ser Phe Leu Ala Met Phe Arg Val Met Thr 340 345 350			1056
caa gac tcc tgg gag agg ctt tac cga cag atc ctg cgg acc tct ggg Gln Asp Ser Trp Glu Arg Leu Tyr Arg Gln Ile Leu Arg Thr Ser Gly 355 360 365			1104
atc tac ttt gtc ttc ttc ttc gtg gtg gtc atc ttc ctg ggc tcc ttc Ile Tyr Phe Val Phe Phe Phe Val Val Val Ile Phe Leu Gly Ser Phe 370 375 380			1152
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cag aac aga aat gta gct gct gag aca gag gcc aag gag aaa atg ttt Gln Asn Arg Asn Val Ala Ala Glu Thr Glu Ala Lys Glu Lys Met Phe 405 410 415			1248
cag gaa gcc cag cag ttg tta agg gag gag aag gag gct ctg gtt gcc Gln Glu Ala Gln Gln Leu Leu Arg Glu Glu Lys Glu Ala Leu Val Ala 420 425 430			1296
atg gga att gac aga agt tcc ctt aat tcc ctt caa gct tca tcc ttt Met Gly Ile Asp Arg Ser Ser Leu Asn Ser Leu Gln Ala Ser Ser Phe 435 440 445			1344
tcc ccg aag aag agg aag ttt ttc ggt agt aag aca aga aag tcc ttc Ser Pro Lys Lys Arg Lys Phe Phe Gly Ser Lys Thr Arg Lys Ser Phe 450 455 460			1392
ttt atg aga ggg tcc aag acg gcc caa gcc tca gcg tct gat tca gag Phe Met Arg Gly Ser Lys Thr Ala Gln Ala Ser Ala Ser Asp Ser Glu 465 470 475 480			1440
gac gat gcc tct aaa aat cca cag ctc ctt gag cag acc aaa cga ctg Asp Asp Ala Ser Lys Asn Pro Gln Leu Leu Glu Gln Thr Lys Arg Leu 485 490 495			1488
tcc cag aac ttg cca gtg gat ctc ttt gat gag cac gtg gac ccc ctc Ser Gln Asn Leu Pro Val Asp Leu Phe Asp Glu His Val Asp Pro Leu 500 505 510			1536
cac agg cag aga gcg ctg agc gct gtc agt atc tta acc atc acc atg His Arg Gln Arg Ala Leu Ser Ala Val Ser Ile Leu Thr Ile Thr Met 515 520 525			1584
cag gaa caa gaa aaa ttc cag gag cct tgt ttc cca tgt ggg aaa aat Gln Glu Gln Glu Lys Phe Gln Glu Pro Cys Phe Pro Cys Gly Lys Asn 530 535 540			1632

ttg gcc tct aag tac ctg gtg tgg gac tgt agc cct cag tgg ctg tgc	1680
Leu Ala Ser Lys Tyr Leu Val Trp Asp Cys Ser Pro Gln Trp Leu Cys	
545 550 555 560	
ata aag aag gtc ctg cgg acc atc atg acg gat ccc ttt act gag ctg	1728
Ile Lys Lys Val Leu Arg Thr Ile Met Thr Asp Pro Phe Thr Glu Leu	
565 570 575	
gcc atc acc atc tgc atc atc atc aat acc gtt ttc tta gcc gtg gag	1776
Ala Ile Thr Ile Cys Ile Ile Ile Asn Thr Val Phe Leu Ala Val Glu	
580 585 590	
cac cac aac atg gat gac aac tta aag acc ata ctg aaa ata gga aac	1824
His His Asn Met Asp Asp Asn Leu Lys Thr Ile Leu Lys Ile Gly Asn	
595 600 605	
tgg gtt ttc acg gga att ttc ata gcg gaa atg tgt ctc aag atc atc	1872
Trp Val Phe Thr Gly Ile Phe Ile Ala Glu Met Cys Leu Lys Ile Ile	
610 615 620	
gcg ctc gac cct tac cac tac ttc cgg cac ggc tgg aat gtt ttt gac	1920
Ala Leu Asp Pro Tyr His Tyr Phe Arg His Gly Trp Asn Val Phe Asp	
625 630 635 640	
agc atc gtg gcc ctc ctg agt ctc gct gat gtg ctc tac aac aca ctg	1968
Ser Ile Val Ala Leu Leu Ser Leu Ala Asp Val Leu Tyr Asn Thr Leu	
645 650 655	
tct gat aac aat agg tct ttc ttg gct tcc ctc aga gtg ctg agg gtc	2016
Ser Asp Asn Asn Arg Ser Phe Leu Ala Ser Leu Arg Val Leu Arg Val	
660 665 670	
ttc aag tta gcc aaa tcc tgg ccc acg tta aac act ctc att aag atc	2064
Phe Lys Leu Ala Lys Ser Trp Pro Thr Leu Asn Thr Leu Ile Lys Ile	
675 680 685	
atc ggc cac tcc gtg ggc gcg ctt gga aac ctg act gtg gtc ctg act	2112
Ile Gly His Ser Val Gly Ala Leu Gly Asn Leu Thr Val Val Leu Thr	
690 695 700	
atc gtg gtc ttc atc ttt tct gtg gtg ggc atg cgg ctc ttc ggc acc	2160
Ile Val Val Phe Ile Phe Ser Val Val Gly Met Arg Leu Phe Gly Thr	
705 710 715 720	
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Lys Phe Asn Lys Thr Ala Tyr Ala Thr Gln Glu Arg Pro Arg Arg Arg	
725 730 735	
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Trp His Met Asp Asn Phe Tyr His Ser Phe Leu Val Val Phe Arg Ile	
740 745 750	
ctc tgt ggg gaa tgg atc gag aac atg tgg ggc tgc atg cag gat atg	2304
Leu Cys Gly Glu Trp Ile Glu Asn Met Trp Gly Cys Met Gln Asp Met	
755 760 765	
gac ggc tcc ccg ttg tgc atc att gtc ttt gtc ctg ata atg gtg atc	2352
Asp Gly Ser Pro Leu Cys Ile Ile Val Phe Val Leu Ile Met Val Ile	
770 775 780	

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Phe Ser Asn Glu Glu Lys Asp Gly Ser Leu Glu Gly Glu Thr Arg Lys	
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acc aaa gtg cag cta gcc ctg gat cgg ttc cgc cgg gcc ttc tcc ttc	2496
Thr Lys Val Gln Leu Ala Leu Asp Arg Phe Arg Arg Ala Phe Ser Phe	
820 825 830	
atg ctg cac gct ctt cag agt ttt tgt tgc aag aaa tgc agg agg aaa	2544
Met Leu His Ala Leu Gln Ser Phe Cys Cys Lys Lys Cys Arg Arg Lys	
835 840 845	
aac tcg cca aag cca aaa gag aca aca gaa agc ttt gct ggt gag aat	2592
Asn Ser Pro Lys Pro Lys Glu Thr Thr Glu Ser Phe Ala Gly Glu Asn	
850 855 860	
aaa gac tca atc ctc ccg gat gcg agg ccc tgg aag gag tat gat aca	2640
Lys Asp Ser Ile Leu Pro Asp Ala Arg Pro Trp Lys Glu Tyr Asp Thr	
865 870 875 880	
gac atg gct ttg tac act gga cag gcc ggg gct ccg ctg gcc cca ctc	2688
Asp Met Ala Leu Tyr Thr Gly Gln Ala Gly Ala Pro Leu Ala Pro Leu	
885 890 895	
gca gag gta gag gac gat gtg gaa tat tgt ggt gaa ggc ggt gcc cta	2736
Ala Glu Val Glu Asp Asp Val Glu Tyr Cys Gly Glu Gly Gly Ala Leu	
900 905 910	
ccc acc tca caa cat agt gct gga gtt cag gcc ggt gac ctc cct cca	2784
Pro Thr Ser Gln His Ser Ala Gly Val Gln Ala Gly Asp Leu Pro Pro	
915 920 925	
gag acc aag cag ctc act agc ccg gat gac caa ggg gtt gaa atg gaa	2832
Glu Thr Lys Gln Leu Thr Ser Pro Asp Asp Gln Gly Val Glu Met Glu	
930 935 940	
gta ttt tct gaa gaa gat ctg cat tta agc ata cag agt cct cga aag	2880
Val Phe Ser Glu Glu Asp Leu His Leu Ser Ile Gln Ser Pro Arg Lys	
945 950 955 960	
aag tct gac gca gtg agc atg ctc tcg gaa tgc agc aca att gac ctg	2928
Lys Ser Asp Ala Val Ser Met Leu Ser Glu Cys Ser Thr Ile Asp Leu	
965 970 975	
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Asn Asp Ile Phe Arg Asn Leu Gln Lys Thr Val Ser Pro Lys Lys Gln	
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Pro Asp Arg Cys Phe Pro Lys Gly Leu Ser Cys His Phe Leu Cys His	
995 1000 1005	
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Lys Thr Asp Lys Arg Lys Ser Pro Trp Val Leu Trp Trp Asn Ile	
1010 1015 1020	
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Phe	Ile	Ile	Phe	Val	Ile	Leu	Leu	Ser	Ser	Gly	Ala	Leu	Ile	Phe	
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Glu	Asp	Val	Asn	Leu	Pro	Ser	Arg	Pro	Gln	Val	Glu	Lys	Leu	Leu	
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Arg	Cys	Thr	Asp	Asn	Ile	Phe	Thr	Phe	Ile	Phe	Leu	Leu	Glu	Met	
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Ala	Trp	Cys	Trp	Leu	Asp	Phe	Leu	Ile	Val	Val	Val	Ser	Val	Leu	
	1100					1105					1110				
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Ser	Leu	Met	Asn	Leu	Pro	Ser	Leu	Lys	Ser	Phe	Arg	Thr	Leu	Arg	
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Ala	Leu	Arg	Pro	Leu	Arg	Ala	Leu	Ser	Gln	Phe	Glu	Gly	Met	Lys	
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Val	Val	Val	Tyr	Ala	Leu	Ile	Ser	Ala	Ile	Pro	Ala	Ile	Leu	Asn	
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Val	Leu	Leu	Val	Cys	Leu	Ile	Phe	Trp	Leu	Val	Phe	Cys	Ile	Leu	
	1160					1165					1170				
gga	gta	aat	tta	ttt	tct	ggg	aag	ttt	gga	agg	tgc	att	aac	ggg	3564
Gly	Val	Asn	Leu	Phe	Ser	Gly	Lys	Phe	Gly	Arg	Cys	Ile	Asn	Gly	
	1175					1180					1185				
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Thr	Asp	Ile	Asn	Met	Tyr	Leu	Asp	Phe	Thr	Glu	Val	Pro	Asn	Arg	
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agc	caa	tgt	aac	att	agt	aat	tac	tcg	tgg	aag	gtc	ccg	cag	gtc	3654
Ser	Gln	Cys	Asn	Ile	Ser	Asn	Tyr	Ser	Trp	Lys	Val	Pro	Gln	Val	
	1205					1210					1215				
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Asn	Phe	Asp	Asn	Val	Gly	Asn	Ala	Tyr	Leu	Ala	Leu	Leu	Gln	Val	
	1220					1225					1230				
gca	acc	tat	aag	ggc	tgg	ctg	gaa	atc	atg	aat	gct	gct	gtc	gat	3744
Ala	Thr	Tyr	Lys	Gly	Trp	Leu	Glu	Ile	Met	Asn	Ala	Ala	Val	Asp	
	1235					1240					1245				
tcc	aga	gag	aaa	gac	gag	cag	ccg	gac	ttt	gag	gcg	aac	ctc	tac	3789
Ser	Arg	Glu	Lys	Asp	Glu	Gln	Pro	Asp	Phe	Glu	Ala	Asn	Leu	Tyr	

1250	1255	1260	
gcg tat ctc tac ttt gtg gtt ttt atc atc ttc ggc tcc ttc ttt			3834
Ala Tyr Leu Tyr Phe Val Val Phe Ile Ile Phe Gly Ser Phe Phe			
1265	1270	1275	
acc ctg aac ctc ttt atc ggt gtt att att gac aac ttc aat cag			3879
Thr Leu Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn Gln			
1280	1285	1290	
cag cag aaa aag tta ggt ggc caa gac att ttt atg aca gaa gaa			3924
Gln Gln Lys Lys Leu Gly Gly Gln Asp Ile Phe Met Thr Glu Glu			
1295	1300	1305	
cag aag aaa tat tac aat gca atg aaa aag tta gga acc aag aaa			3969
Gln Lys Lys Tyr Tyr Asn Ala Met Lys Lys Leu Gly Thr Lys Lys			
1310	1315	1320	
cct caa aag ccc atc cca agg ccc ctg aac aaa tgt caa gcc ttt			4014
Pro Gln Lys Pro Ile Pro Arg Pro Leu Asn Lys Cys Gln Ala Phe			
1325	1330	1335	
gtg ttc gac ctg gtc aca agc cag gtc ttt gac gtc atc atc ctg			4059
Val Phe Asp Leu Val Thr Ser Gln Val Phe Asp Val Ile Ile Leu			
1340	1345	1350	
ggt ctt att gtc tta aat atg att atc atg atg gct gaa tct gcc			4104
Gly Leu Ile Val Leu Asn Met Ile Ile Met Met Ala Glu Ser Ala			
1355	1360	1365	
gac cag ccc aaa gat gtg aag aaa acc ttt gat atc ctc aac ata			4149
Asp Gln Pro Lys Asp Val Lys Lys Thr Phe Asp Ile Leu Asn Ile			
1370	1375	1380	
gcc ttc gtg gtc atc ttt acc ata gag tgt ctc atc aaa gtc ttt			4194
Ala Phe Val Val Ile Phe Thr Ile Glu Cys Leu Ile Lys Val Phe			
1385	1390	1395	
gct ttg agg caa cac tac ttc acc aat ggc tgg aac tta ttt gat			4239
Ala Leu Arg Gln His Tyr Phe Thr Asn Gly Trp Asn Leu Phe Asp			
1400	1405	1410	
tgt gtg gtc gtg gtt ctt tct atc att agt acc ctg gtt tcc cgc			4284
Cys Val Val Val Val Leu Ser Ile Ile Ser Thr Leu Val Ser Arg			
1415	1420	1425	
ttg gag gac agt gac att tct ttc ccg ccc acg ctc ttc aga gtc			4329
Leu Glu Asp Ser Asp Ile Ser Phe Pro Pro Thr Leu Phe Arg Val			
1430	1435	1440	
gtc cgc ttg gct cgg att ggt cga atc ctc agg ctg gtc cgg gct			4374
Val Arg Leu Ala Arg Ile Gly Arg Ile Leu Arg Leu Val Arg Ala			
1445	1450	1455	
gcc cgg gga atc agg acc ctc ctc ttt gct ttg atg atg tct ctc			4419
Ala Arg Gly Ile Arg Thr Leu Leu Phe Ala Leu Met Met Ser Leu			
1460	1465	1470	
ccc tct ctc ttc aac atc ggt ctg ctg ctc ttc ctg gtg atg ttc			4464
Pro Ser Leu Phe Asn Ile Gly Leu Leu Leu Phe Leu Val Met Phe			
1475	1480	1485	

att tac gcc atc ttt ggg atg agc tgg ttt tcc aaa gtg aag aag	4509
Ile Tyr Ala Ile Phe Gly Met Ser Trp Phe Ser Lys Val Lys Lys	
1490 1495 1500	
ggc tcc ggg atc gac gac atc ttc aac ttc gag acc ttt acg ggc	4554
Gly Ser Gly Ile Asp Asp Ile Phe Asn Phe Glu Thr Phe Thr Gly	
1505 1510 1515	
agc atg ctg tgc ctc ttc cag ata acc act tcg gct ggc tgg gat	4599
Ser Met Leu Cys Leu Phe Gln Ile Thr Thr Ser Ala Gly Trp Asp	
1520 1525 1530	
acc ctc ctc aac ccc atg ctg gag gca aaa gaa cac tgc aac tcc	4644
Thr Leu Leu Asn Pro Met Leu Glu Ala Lys Glu His Cys Asn Ser	
1535 1540 1545	
tcc tcc caa gac agc tgt cag cag ccg cag ata gcc gtc gtc tac	4689
Ser Ser Gln Asp Ser Cys Gln Gln Pro Gln Ile Ala Val Val Tyr	
1550 1555 1560	
ttc gtc agt tac atc atc atc tcc ttc ctc atc gtg gtc aac atg	4734
Phe Val Ser Tyr Ile Ile Ile Ser Phe Leu Ile Val Val Asn Met	
1565 1570 1575	
tac atc gct gtg atc ctc gag aac ttc aac aca gcc acg gag gag	4779
Tyr Ile Ala Val Ile Leu Glu Asn Phe Asn Thr Ala Thr Glu Glu	
1580 1585 1590	
agc gag gac cct ctg gga gag gac gac ttt gaa atc ttc tat gag	4824
Ser Glu Asp Pro Leu Gly Glu Asp Asp Phe Glu Ile Phe Tyr Glu	
1595 1600 1605	
gtc tgg gag aag ttt gac ccc gag gcg tcg cag ttc atc cag tat	4869
Val Trp Glu Lys Phe Asp Pro Glu Ala Ser Gln Phe Ile Gln Tyr	
1610 1615 1620	
tcg gcc ctc tct gac ttt gcg gac gcc ctg ccg gag ccg ttg cgt	4914
Ser Ala Leu Ser Asp Phe Ala Asp Ala Leu Pro Glu Pro Leu Arg	
1625 1630 1635	
gtg gcc aag ccg aat aag ttt cag ttt cta gtg atg gac ttg ccc	4959
Val Ala Lys Pro Asn Lys Phe Gln Phe Leu Val Met Asp Leu Pro	
1640 1645 1650	
atg gtg atg ggc gac cgc ctc cat tgc atg gat gtt ctc ttt gct	5004
Met Val Met Gly Asp Arg Leu His Cys Met Asp Val Leu Phe Ala	
1655 1660 1665	
ttc act acc agg gtc ctc ggg gac tcc agc ggc ttg gat acc atg	5049
Phe Thr Thr Arg Val Leu Gly Asp Ser Ser Gly Leu Asp Thr Met	
1670 1675 1680	
aaa acc atg atg gag gag aag ttt atg gag gcc aac cct ttt aag	5094
Lys Thr Met Met Glu Glu Lys Phe Met Glu Ala Asn Pro Phe Lys	
1685 1690 1695	
aag ctc tac gag ccc ata gtc acc acc acc aag agg aag gag gag	5139
Lys Leu Tyr Glu Pro Ile Val Thr Thr Thr Lys Arg Lys Glu Glu	
1700 1705 1710	

gag caa ggc gcc gcc gtc atc cag agg gcc tac cgg aaa cac atg 5184
 Glu Gln Gly Ala Ala Val Ile Gln Arg Ala Tyr Arg Lys His Met
 1715 1720 1725

gag aag atg gtc aaa ctg agg ctg aag gac agg tca agt tca tcg 5229
 Glu Lys Met Val Lys Leu Arg Leu Lys Asp Arg Ser Ser Ser Ser
 1730 1735 1740

cac cag gtg ttt tgc aat gga gac ttg tcc agc ttg gat gtg gcc 5274
 His Gln Val Phe Cys Asn Gly Asp Leu Ser Ser Leu Asp Val Ala
 1745 1750 1755

aag gtc aag gtt cac aat gac tga 5298
 Lys Val Lys Val His Asn Asp
 1760 1765

<210> 20

<211> 1765

<212> PRT

<213> Rattus norvegicus

<400> 20

Met Glu Glu Arg Tyr Tyr Pro Val Ile Phe Pro Asp Glu Arg Asn Phe
 1 5 10 15

Arg Pro Phe Thr Ser Asp Ser Leu Ala Ala Ile Glu Lys Arg Ile Ala
 20 25 30

Ile Gln Lys Glu Arg Lys Lys Ser Lys Asp Lys Ala Ala Ala Glu Pro
 35 40 45

Gln Pro Arg Pro Gln Leu Asp Leu Lys Ala Ser Arg Lys Leu Pro Lys
 50 55 60

Leu Tyr Gly Asp Ile Pro Pro Glu Leu Val Ala Lys Pro Leu Glu Asp
 65 70 75 80

Leu Asp Pro Phe Tyr Lys Asp His Lys Thr Phe Met Val Leu Asn Lys
 85 90 95

Lys Arg Thr Ile Tyr Arg Phe Ser Ala Lys Arg Ala Leu Phe Ile Leu
 100 105 110

Gly Pro Phe Asn Pro Leu Arg Ser Leu Met Ile Arg Ile Ser Val His
 115 120 125

Ser Val Phe Ser Met Phe Ile Ile Cys Thr Val Ile Ile Asn Cys Met
 130 135 140

Phe Met Ala Asn Ser Met Glu Arg Ser Phe Asp Asn Asp Ile Pro Glu

145		150		155		160
Tyr Val Phe Ile Gly Ile Tyr Ile Leu Glu Ala Val Ile Lys Ile Leu	165		170		175	
Ala Arg Gly Phe Ile Val Asp Glu Phe Ser Phe Leu Arg Asp Pro Trp	180		185		190	
Asn Trp Leu Asp Phe Ile Val Ile Gly Thr Ala Ile Ala Thr Cys Phe	195		200		205	
Pro Gly Ser Gln Val Asn Leu Ser Ala Leu Arg Thr Phe Arg Val Phe	210		215		220	
Arg Ala Leu Lys Ala Ile Ser Val Ile Ser Gly Leu Lys Val Ile Val	225		230		235	240
Gly Ala Leu Leu Arg Ser Val Lys Lys Leu Val Asp Val Met Val Leu	245		250		255	
Thr Leu Phe Cys Leu Ser Ile Phe Ala Leu Val Gly Gln Gln Leu Phe	260		265		270	
Met Gly Ile Leu Asn Gln Lys Cys Ile Lys His Asn Cys Gly Pro Asn	275		280		285	
Pro Ala Ser Asn Lys Asp Cys Phe Glu Lys Glu Lys Asp Ser Glu Asp	290		295		300	
Phe Ile Met Cys Gly Thr Trp Leu Gly Ser Arg Pro Cys Pro Asn Gly	305		310		315	320
Ser Thr Cys Asp Lys Thr Thr Leu Asn Pro Asp Asn Asn Tyr Thr Lys	325		330		335	
Phe Asp Asn Phe Gly Trp Ser Phe Leu Ala Met Phe Arg Val Met Thr	340		345		350	
Gln Asp Ser Trp Glu Arg Leu Tyr Arg Gln Ile Leu Arg Thr Ser Gly	355		360		365	
Ile Tyr Phe Val Phe Phe Phe Val Val Val Ile Phe Leu Gly Ser Phe	370		375		380	
Tyr Leu Leu Asn Leu Thr Leu Ala Val Val Thr Met Ala Tyr Glu Glu	385		390		395	400

Gln Asn Arg Asn Val Ala Ala Glu Thr Glu Ala Lys Glu Lys Met Phe
 405 410 415

Gln Glu Ala Gln Gln Leu Leu Arg Glu Glu Lys Glu Ala Leu Val Ala
 420 425 430

Met Gly Ile Asp Arg Ser Ser Leu Asn Ser Leu Gln Ala Ser Ser Phe
 435 440 445

Ser Pro Lys Lys Arg Lys Phe Phe Gly Ser Lys Thr Arg Lys Ser Phe
 450 455 460

Phe Met Arg Gly Ser Lys Thr Ala Gln Ala Ser Ala Ser Asp Ser Glu
 465 470 475 480

Asp Asp Ala Ser Lys Asn Pro Gln Leu Leu Glu Gln Thr Lys Arg Leu
 485 490 495

Ser Gln Asn Leu Pro Val Asp Leu Phe Asp Glu His Val Asp Pro Leu
 500 505 510

His Arg Gln Arg Ala Leu Ser Ala Val Ser Ile Leu Thr Ile Thr Met
 515 520 525

Gln Glu Gln Glu Lys Phe Gln Glu Pro Cys Phe Pro Cys Gly Lys Asn
 530 535 540

Leu Ala Ser Lys Tyr Leu Val Trp Asp Cys Ser Pro Gln Trp Leu Cys
 545 550 555 560

Ile Lys Lys Val Leu Arg Thr Ile Met Thr Asp Pro Phe Thr Glu Leu
 565 570 575

Ala Ile Thr Ile Cys Ile Ile Ile Asn Thr Val Phe Leu Ala Val Glu
 580 585 590

His His Asn Met Asp Asp Asn Leu Lys Thr Ile Leu Lys Ile Gly Asn
 595 600 605

Trp Val Phe Thr Gly Ile Phe Ile Ala Glu Met Cys Leu Lys Ile Ile
 610 615 620

Ala Leu Asp Pro Tyr His Tyr Phe Arg His Gly Trp Asn Val Phe Asp
 625 630 635 640

Ser Ile Val Ala Leu Leu Ser Leu Ala Asp Val Leu Tyr Asn Thr Leu
645 650 655

Ser Asp Asn Asn Arg Ser Phe Leu Ala Ser Leu Arg Val Leu Arg Val
660 665 670

Phe Lys Leu Ala Lys Ser Trp Pro Thr Leu Asn Thr Leu Ile Lys Ile
675 680 685

Ile Gly His Ser Val Gly Ala Leu Gly Asn Leu Thr Val Val Leu Thr
690 695 700

Ile Val Val Phe Ile Phe Ser Val Val Gly Met Arg Leu Phe Gly Thr
705 710 715 720

Lys Phe Asn Lys Thr Ala Tyr Ala Thr Gln Glu Arg Pro Arg Arg Arg
725 730 735

Trp His Met Asp Asn Phe Tyr His Ser Phe Leu Val Val Phe Arg Ile
740 745 750

Leu Cys Gly Glu Trp Ile Glu Asn Met Trp Gly Cys Met Gln Asp Met
755 760 765

Asp Gly Ser Pro Leu Cys Ile Ile Val Phe Val Leu Ile Met Val Ile
770 775 780

Gly Lys Leu Val Val Leu Asn Leu Phe Ile Ala Leu Leu Leu Asn Ser
785 790 795 800

Phe Ser Asn Glu Glu Lys Asp Gly Ser Leu Glu Gly Glu Thr Arg Lys
805 810 815

Thr Lys Val Gln Leu Ala Leu Asp Arg Phe Arg Arg Ala Phe Ser Phe
820 825 830

Met Leu His Ala Leu Gln Ser Phe Cys Cys Lys Lys Cys Arg Arg Lys
835 840 845

Asn Ser Pro Lys Pro Lys Glu Thr Thr Glu Ser Phe Ala Gly Glu Asn
850 855 860

Lys Asp Ser Ile Leu Pro Asp Ala Arg Pro Trp Lys Glu Tyr Asp Thr
865 870 875 880

Asp Met Ala Leu Tyr Thr Gly Gln Ala Gly Ala Pro Leu Ala Pro Leu
 885 890 895

Ala Glu Val Glu Asp Asp Val Glu Tyr Cys Gly Glu Gly Gly Ala Leu
 900 905 910

Pro Thr Ser Gln His Ser Ala Gly Val Gln Ala Gly Asp Leu Pro Pro
 915 920 925

Glu Thr Lys Gln Leu Thr Ser Pro Asp Asp Gln Gly Val Glu Met Glu
 930 935 940

Val Phe Ser Glu Glu Asp Leu His Leu Ser Ile Gln Ser Pro Arg Lys
 945 950 955 960

Lys Ser Asp Ala Val Ser Met Leu Ser Glu Cys Ser Thr Ile Asp Leu
 965 970 975

Asn Asp Ile Phe Arg Asn Leu Gln Lys Thr Val Ser Pro Lys Lys Gln
 980 985 990

Pro Asp Arg Cys Phe Pro Lys Gly Leu Ser Cys His Phe Leu Cys His
 995 1000 1005

Lys Thr Asp Lys Arg Lys Ser Pro Trp Val Leu Trp Trp Asn Ile
 1010 1015 1020

Arg Lys Thr Cys Tyr Gln Ile Val Lys His Ser Trp Phe Glu Ser
 1025 1030 1035

Phe Ile Ile Phe Val Ile Leu Leu Ser Ser Gly Ala Leu Ile Phe
 1040 1045 1050

Glu Asp Val Asn Leu Pro Ser Arg Pro Gln Val Glu Lys Leu Leu
 1055 1060 1065

Arg Cys Thr Asp Asn Ile Phe Thr Phe Ile Phe Leu Leu Glu Met
 1070 1075 1080

Ile Leu Lys Trp Val Ala Phe Gly Phe Arg Arg Tyr Phe Thr Ser
 1085 1090 1095

Ala Trp Cys Trp Leu Asp Phe Leu Ile Val Val Val Ser Val Leu
 1100 1105 1110

Ser Leu Met Asn Leu Pro Ser Leu Lys Ser Phe Arg Thr Leu Arg

1115	1120	1125
Ala Leu Arg Pro Leu Arg 1130	Ala Leu Ser Gln Phe 1135	Glu Gly Met Lys 1140
Val Val Val Tyr Ala Leu 1145	Ile Ser Ala Ile Pro 1150	Ala Ile Leu Asn 1155
Val Leu Leu Val Cys Leu 1160	Ile Phe Trp Leu Val 1165	Phe Cys Ile Leu 1170
Gly Val Asn Leu Phe Ser 1175	Gly Lys Phe Gly Arg 1180	Cys Ile Asn Gly 1185
Thr Asp Ile Asn Met Tyr 1190	Leu Asp Phe Thr Glu 1195	Val Pro Asn Arg 1200
Ser Gln Cys Asn Ile Ser 1205	Asn Tyr Ser Trp Lys 1210	Val Pro Gln Val 1215
Asn Phe Asp Asn Val Gly 1220	Asn Ala Tyr Leu Ala 1225	Leu Leu Gln Val 1230
Ala Thr Tyr Lys Gly Trp 1235	Leu Glu Ile Met Asn 1240	Ala Ala Val Asp 1245
Ser Arg Glu Lys Asp Glu 1250	Gln Pro Asp Phe Glu 1255	Ala Asn Leu Tyr 1260
Ala Tyr Leu Tyr Phe Val 1265	Val Phe Ile Ile Phe 1270	Gly Ser Phe Phe 1275
Thr Leu Asn Leu Phe Ile 1280	Gly Val Ile Ile Asp 1285	Asn Phe Asn Gln 1290
Gln Gln Lys Lys Leu Gly 1295	Gly Gln Asp Ile Phe 1300	Met Thr Glu Glu 1305
Gln Lys Lys Tyr Tyr Asn 1310	Ala Met Lys Lys Leu 1315	Gly Thr Lys Lys 1320
Pro Gln Lys Pro Ile Pro 1325	Arg Pro Leu Asn Lys 1330	Cys Gln Ala Phe 1335
Val Phe Asp Leu Val Thr 1340	Ser Gln Val Phe Asp 1345	Val Ile Ile Leu 1350

Gly Leu Ile Val Leu Asn Met Ile Ile Met Met Ala Glu Ser Ala
1355 1360 1365

Asp Gln Pro Lys Asp Val Lys Lys Thr Phe Asp Ile Leu Asn Ile
1370 1375 1380

Ala Phe Val Val Ile Phe Thr Ile Glu Cys Leu Ile Lys Val Phe
1385 1390 1395

Ala Leu Arg Gln His Tyr Phe Thr Asn Gly Trp Asn Leu Phe Asp
1400 1405 1410

Cys Val Val Val Val Leu Ser Ile Ile Ser Thr Leu Val Ser Arg
1415 1420 1425

Leu Glu Asp Ser Asp Ile Ser Phe Pro Pro Thr Leu Phe Arg Val
1430 1435 1440

Val Arg Leu Ala Arg Ile Gly Arg Ile Leu Arg Leu Val Arg Ala
1445 1450 1455

Ala Arg Gly Ile Arg Thr Leu Leu Phe Ala Leu Met Met Ser Leu
1460 1465 1470

Pro Ser Leu Phe Asn Ile Gly Leu Leu Leu Phe Leu Val Met Phe
1475 1480 1485

Ile Tyr Ala Ile Phe Gly Met Ser Trp Phe Ser Lys Val Lys Lys
1490 1495 1500

Gly Ser Gly Ile Asp Asp Ile Phe Asn Phe Glu Thr Phe Thr Gly
1505 1510 1515

Ser Met Leu Cys Leu Phe Gln Ile Thr Thr Ser Ala Gly Trp Asp
1520 1525 1530

Thr Leu Leu Asn Pro Met Leu Glu Ala Lys Glu His Cys Asn Ser
1535 1540 1545

Ser Ser Gln Asp Ser Cys Gln Gln Pro Gln Ile Ala Val Val Tyr
1550 1555 1560

Phe Val Ser Tyr Ile Ile Ile Ser Phe Leu Ile Val Val Asn Met
1565 1570 1575

Tyr Ile Ala Val Ile Leu Glu Asn Phe Asn Thr Ala Thr Glu Glu
1580 1585 1590

Ser Glu Asp Pro Leu Gly Glu Asp Asp Phe Glu Ile Phe Tyr Glu
1595 1600 1605

Val Trp Glu Lys Phe Asp Pro Glu Ala Ser Gln Phe Ile Gln Tyr
1610 1615 1620

Ser Ala Leu Ser Asp Phe Ala Asp Ala Leu Pro Glu Pro Leu Arg
1625 1630 1635

Val Ala Lys Pro Asn Lys Phe Gln Phe Leu Val Met Asp Leu Pro
1640 1645 1650

Met Val Met Gly Asp Arg Leu His Cys Met Asp Val Leu Phe Ala
1655 1660 1665

Phe Thr Thr Arg Val Leu Gly Asp Ser Ser Gly Leu Asp Thr Met
1670 1675 1680

Lys Thr Met Met Glu Glu Lys Phe Met Glu Ala Asn Pro Phe Lys
1685 1690 1695

Lys Leu Tyr Glu Pro Ile Val Thr Thr Thr Lys Arg Lys Glu Glu
1700 1705 1710

Glu Gln Gly Ala Ala Val Ile Gln Arg Ala Tyr Arg Lys His Met
1715 1720 1725

Glu Lys Met Val Lys Leu Arg Leu Lys Asp Arg Ser Ser Ser Ser
1730 1735 1740

His Gln Val Phe Cys Asn Gly Asp Leu Ser Ser Leu Asp Val Ala
1745 1750 1755

Lys Val Lys Val His Asn Asp
1760 1765

<210> 21

<211> 8

<212> PRT

<213> Rattus norvegicus

<400> 21

Ile Asp His His His His His His
1 5 8

<210> 22
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide for
raising antibodies

<400> 22
Cys Asn Gly Asp Leu Ser Ser Phe Gly Val Ala Lys Gly Lys Val His
1 5 10 15

<210> 23
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Peptide for
raising antibodies

<400> 23
Cys Asn Asp Gly Leu Ser Ser Leu Asp Val Ala Lys Val Lys Val His
1 5 10 15

Asn Asp

<210> 24
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 24
acgccttaag gtgaagatgg atgacagatg ct 32

<210> 25
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 25
ggttctagat cagtcacagt ggaccttgcc 30

<210> 26
<211> 23

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 26
gcctcggcga aagtagtggt agg 23

<210> 27
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 27
cctaccacta ctttcgccga gg 22

<210> 28
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 28
tacgaagtaa atgtaaccga gtga 24

<210> 29
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 29
ctcggttaca tttacttcgt agt 23

<210> 30
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 30
tatatatgcg gccgcaagat ggaggagagg tactatccag 40

<210> 31
<211> 24
<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR primer

<400> 31

tattgtggtg ttccatggcc aaga

<210> 32

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR primer

<400> 32

gccatggaac accacaatat g

21

<210> 33

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR primer

<400> 33

cacgaagtaa aggtatgcgt atag

24

<210> 34

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR primer

<400> 34

tatgaatgca gctgttgatt ccag

24

<210> 35

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PCR primer

<400> 35

gatcgatcgg gccctcagtc acaatgaacc ttgatcttgg g

41

